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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,621	05/18/2007	Ho-jun Lee	29137.193.00-US	1531

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EXAMINER	
BOHATY, ANDREW K	
ART UNIT	PAPER NUMBER
1786	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/593,621	LEE ET AL.	
	Examiner	Art Unit	
	Andrew K. Bohaty	1786	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 September 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2006/09/11*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 6 is objected to because of the following informalities:

2. The phrase "organic silane, metal alkoxide water and filler" should be correct to "organic silane, metal alkoxide, water, and filler.

3. Furthermore regarding claim 6, the claims states is "a mixture comprising organic silane, metal alkoxide water and filler" and the specification lacks antecedent basis for this limitation. The specification does not state that water is present in the composition.

4. Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-5, 12, 15, and 18-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Ito (US 6,649,231) (hereafter "Ito").

7. Regarding claims 1-4, 12, 15, and 21-23, Ito teaches an optical compensatory sheet comprising a 80 μm polymer base layer composed of cellulose acetate, a 1.5 μm orientation layer (applicant's protective layer) composed of a crosslinked organic composition (the applicant's teach in the specification that the protective layer is a crosslinked layer that can be used as an orientation layer as well (page 9 lines 7-18);

therefore, the applicant's protective layer and Ito's orientation layer are the same), and an anisotropic layer (applicant's polymer layer) and Ito teaches the anisotropic layer has a negative birefringence, which would also have a negative optical retardation (column 8 lines 60-67, column 22 lines 49-67, and column 23 lines 1-48). Ito teaches the polymer base layer has a negative optical retardation of 130 nm in the out of plane direction and has a positive optical retardation of 20 nm in the in plane direction (column 22 lines 57-61).

8. Regarding claims 18-20, Ito teaches the compensatory sheet is used in an LCD device and teaches the LCD that uses the compensatory sheet can be a vertical alignment LCD or a twist nematic LCD (column 18 lines 23-67).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

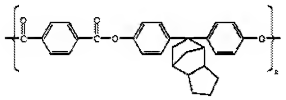
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 1-5, 9, 13-16, and 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elman et al. (US 2004/0027520) (hereafter "Elman") in view of Nair et al. (US 2004/0008304) (hereafter "Nair").

13. Regarding claims 1-5, 9, 13-16, and 21-23, Elman teaches a LCD comprising a multilayer optical compensator composed of a 80 μm polymer base layer composed of TAC and a 3.4 μm polymer layer composed of a polyarylate with the following structure,



(paragraphs [0060]-[0062], Table I and Table II). Elman teaches that the polymer base layer has a negative optical retardation of 58 nm in the out of plane direction and has a positive optical retardation of 3 nm in the in plane direction (Table I, first entry only the TAC layer is present). Elman teaches the combined out of plane retardation is -74 nm (Table II). Elman teaches that the combined thickness of the layers of the film is 115 μm or less (paragraph [0046]).

14. Elman does not teach where the compensator comprises a protective layer and where the base layer has a positive optical retardation of at least 20 nm in the in plane direction.

15. Nair teaches a compensator comprising a crosslinked barrier layer located between the support and the polymer layer (paragraph [0002]). Nair teaches that barrier layer impedes the passage of components from support layer to the other layers in the device (paragraph [0025]). Nair teaches the barrier layer (applicant's protective layer) can be an organic layer composed of a material made from monomer groups having UV hardened or heart hardened acrylate, methacrylate, or acrylate/methacrylate (paragraphs [0024]-[0030]). Nair also teaches that TAC supports can have a positive optical retardation of at least 20 nm in the in plane direction if this larger value is desired for the device (paragraph [0022]).

16. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the multilayer optical compensator of Elman to include a barrier layer (applicant's protective layer) composed of a of an organic material made from monomer groups having UV hardened or heart hardened acrylate, methacrylate, or acrylate/methacrylate. The motivation would have been to layer impede the passage of components from support layer to the other layers in the device. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the base polymer layer, so it has a positive optical retardation of at least 20 nm in the in plane direction. It is well known in the art that one would change to positive optical retardation a layer to change the optical properties of the device and Nair

teaches that TAC supports can have a positive optical retardation of at least 20 nm in the in plane direction. The motivation would have been to adjust the optical properties of the device until the desired positive optical retardations and negative optical retardations were reached.

17. Regarding claims 18-20, Elman teaches the multilayer compensator can be is used in an LCD device and teaches the LCD that uses the compensatory sheet can be a vertically alignment LCD or sheet switching LCD (paragraph [0054]).

18. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elman et al. (US 2004/0027520) (hereafter "Elman") in view of Nair et al. (US 2004/0008304) (hereafter "Nair") as applied to claims 1-5, 9, 13-16, and 18-23 above, and further in view of Furuya et al. (US 2003/0236347) (hereafter "Furuya").

19. Regarding claims 6-8, Elman in view of Nair does not specifically teach where the barrier layer (applicant's protective layer) is composed of an organic/inorganic hybrid material.

20. Furuya teaches a hardcoat material composed of organic/inorganic hybrid material (paragraphs [0006]-[0015]). Furuya teaches hardcoat is composed of an organic silane compound (paragraph [0016]) and a metal oxide, such as silica or titanium oxide, which are also acting as fillers (paragraph [0029]). Claim 6 is a product by process claim; therefore, the prior art does not have the have the same process as the applicant as long as the end product is the same. In the applicant's claim 6, the water is not in final product and it is well known that the metal alkoxide will turn into

metal oxides when exposed to water; therefore, the metal oxides of Furuya meet the applicant's claim of a metal alkoxide. Also, the applicant does not claim that the filler and metal alkoxide need to be different; therefore, the metal oxides of the Furuya meet both components of the claim. Furuya teaches a hardcoat composition comprising methyltrimethoxysilane, water, and silica sol (paragraph [0095]), where the amount of methyltrimethoxysilane is 69.38 based on 100 parts of the whole composition (when the solvent is removed), and where the amount of silica sol is 30.62 based on 100 parts of the whole composition (when the solvent is removed) (paragraph [0095]). Furuya teaches that hardcoat prevents micro-cracking and separation from the layer over time (paragraph [0006]).

21. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the hardcoat material of Furuya as the barrier layer in Elman in view of Nair. This would lead to a barrier layer (applicant's protective layer), with an organic/inorganic hybrid with a composition of an organic silane, metal alkoxide, and a filler, where the amount of organic silane is 69.38 based on 100 parts of the whole composition, and where the amount of metal alkoxide (metal oxide) is 30.62 based on 100 parts of the whole composition. The motivation would have been to use a protective layer that prevents micro-cracking and separation from the layer over time.

22. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Elman et al. (US 2004/0027520) (hereafter "Elman") in view of Nair et al. (US 2004/0008304) (hereafter "Nair") as applied to claims 1-5, 9, 13-16, and 18-23 above, and further in

view of Junko et al. (KR 1999-007963) (hereafter "Junko"), where a machine translation is used as an English equivalent.

23. Regarding claim 10, Elman in view of Nair does not specifically teach where the barrier layer (applicant's protective layer) is composed of an organic/inorganic hybrid material.

24. Junko teaches a resin composition used for coating/protecting underlying layers (paragraph 2). Junko teaches the resin composition is composed of an organic/inorganic hybrid material that is characterized by being able to be UV hardened or heart hardened and includes a hardening catalyst and a silica-dispersed oligomer solution of organic silane produced by partial hydrolysis of hydrolyzed organic silane from colloidal silica dispersed in organic solvent (paragraphs 15-40). Junko teaches resin composition has high toughness and good stability as well as no cracking a thin thickness (paragraph 14).

25. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use resin composition of Junko as the barrier layer (protective layer) in Elman in view of Nair. This would lead to a barrier layer (applicant's protective layer), with an organic/inorganic hybrid with a composition that is characterized by being able to be UV hardened or heart hardened and includes a hardening catalyst and a silica-dispersed oligomer solution of organic silane produced by partial hydrolysis of hydrolyzed organic silane from colloidal silica dispersed in organic solvent. The motivation would have been to use a resin composition that has high toughness and good stability as well as no cracking a thin thickness.

26. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Elman et al. (US 2004/0027520) (hereafter "Elman") in view of Nair et al. (US 2004/0008304) (hereafter "Nair") as applied to claims 1-5, 9, 13-16, and 18-23 above, and further in view of Lee et al. (KR 2002-020599) (hereafter "Lee"), where a machine translation is used as an English equivalent.

27. Regarding claim 10, Elman in view of Nair does not specifically teach where the barrier layer (applicant's protective layer) is composed of an organic/inorganic hybrid material.

28. Lee teaches a resin composition used for hard protective covering (page 2 first paragraph). Lee teaches the resin composition is an organic/inorganic hybrid composition containing silicon oligomer solution having at least two acrylate functional groups obtained from hydrolysis of silicone coupling agent and oil colloid silica which are able to be UV-hardened or heat-hardened, acrylate oligomer solution, acrylate monomer solution, and photo-initiator and/or thermal initiator (page 2 second paragraph and page 3 paragraphs after heading structure & operation of the invention). Lee teaches resin composition has good abrasion resistance, heat resistance, weatherability, and storage stability (page 3 paragraph after heading The Technical Challenges of the Invention).

29. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use resin composition of Lee as the barrier layer (protective layer) in Elman in view of Nair. This would lead to a barrier layer (applicant's protective

layer), with an organic/inorganic hybrid composition containing silicon oligomer solution having at least two acrylate functional groups obtained from hydrolysis of silicone coupling agent and oil colloid silica which are able to be UV-hardened or heat-hardened, acrylate oligomer solution, acrylate monomer solution, and photo-initiator and/or thermal initiator. The motivation would have been to use a resin composition that has good abrasion resistance, heat resistance, weatherability, and storage stability.

30. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Elman et al. (US 2004/0027520) (hereafter "Elman") in view of Nair et al. (US 2004/0008304) (hereafter "Nair") as applied to claims 1-5, 9, 13-16, and 18-23 above, and further in view of Komada et al. (US 2004/0052975) (hereafter "Komada").

31. Regarding claim 12, Elman in view of Nair does not specific the thickness of the barrier layer (applicant's protective layer).

32. Komada teaches a barrier layer in a laminated structure for an LCD (paragraphs [0002] and [0118]). Komada teaches that the barrier layer can range in thickness from 5 nm to 500 nm (or 0.005 μm to 0.5 μm) and teaches that layers thicker than 0.5 μm can lead to films that crack on flexible supports and layers thinner that 0.005 μm do not have good barrier properties (paragraph [0064]). Komada specifically teaches that layer can have a thickness of 0.1 μm (paragraph [0125]).

33. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the thickness of the barrier layer to be between 0.01 μm to

about 0.5 μm. The motivation would have been to make a layer that has good barrier properties and good flexibility.

34. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Elman et al. (US 2004/0027520) (hereafter "Elman") in view of Nair et al. (US 2004/0008304) (hereafter "Nair") as applied to claims 1-5, 9, 13-16, and 18-23 above, and further in view of Shukla et al. (US 2004/0009311) (hereafter "Shukla")

35. Regarding claim 17, Elman in view of Nair does not teach where the polyarylate has a molecular weight average of at least 20,000 g/mol.

36. Shukla teaches an optical compensator comprising high molecular weight polymers (paragraph [0002]). Shukla teaches polymers should have a molecular weight above 45,000 g/mol (paragraph [0021]). Shukla teaches that polymers with high molecular weight improve the uniformity and quality of the film and does not affect the adhesion of the film or the overall optical properties of the film (paragraph [0009] and [0020]).

37. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the polyarylate of Elman in view of Nair, so the molecular weight was above 45,000 g/mol. The motivation would have been to improve the uniformity and quality of the film.

Conclusion

38. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew K. Bohaty whose telephone number is (571)270-1148. The examiner can normally be reached on Monday through Thursday 7:30 am to 5:00 pm EST and every other Friday from 7:30 am to 4 pm EST.

39. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on (571)272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

40. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. K. B./
Andrew K. Bohaty
Patent Examiner, Art Unit 1786

/D. Lawrence Tarazano/
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